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TRANSPARENCY MEASUREMENTS USING A GAMMA-RAY IMAGER

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One of the issues encountered by the US and Russia as they strive to reduce their respective nuclear stockpiles is the ability to identify and verify the location of weapons components throughout the demolition process. This task is inherently difficult due to the classified nature of the weapons components. During inspections, a balance must be drawn between revealing sufficient information to ascertain the authenticity of a part and not revealing critical (classified) design information. Gamma-ray detection using a collimated inorganic scintillator detector scanned across a part's storage container to provide both size and isotope information is one possible technique. The time required for such inspections can be significantly decreased through the use of GRIS, the Gamma-Ray Imaging System.[1] GRIS allows one to obtain an image in the light of gamma-rays emitted by SNM. It is based on inorganic scintillator technology and combines the scan and isotope identification in a single step. The position resolution at the source may be easily determined from three simple dimensional measurements of the imager to verify that too much information is not obtained. Results of measurements on SNM will be presented.

[1]K.P. Ziock, C.J. Hailey, T.B. Gosnell, J.H. Lupton, *IEEE Trans. on Nucl. Sci.*, **39**, 1992, p. 1046.

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